

## ABSTRACT OF THE DISCLOSURE

Using irregular optical interconnections to compensate for non-uniformities in analog optical processors, such as matrix-vector (M-V) optical processors, is disclosed.

An M-V processor of one embodiments includes two optical devices, such as spatial light

5 modulators (SLM's). One of the devices represents a matrix, and the other device

represents a vector. Each device has non-uniformities. The non-uniformities of the

devices are at least substantially matched to one another, where the optical

interconnections between the devices are irregular. Light traveling through the devices

represents the product of the matrix and the vector. An analog-to-digital (A/D)

10 processor, or converter, can be used to subtract any errors in the product even after

substantially matching the non-uniformities, by non-digital electrical or photonic

processing.